

Global Climate Change and NEPA: The Difficulty with
Cumulative Impacts Analysis

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I. INTRODUCTION

For over 30 years, the National Environmental Policy Act (NEPA) has required federal agencies to study the environmental impacts of actions "utiliz[ing] a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment."¹ As science has focused on the human impacts leading to global climate change, an increased interest on how this topic can and should be addressed in NEPA evaluations has developed.² In 1997, the Council on Environmental Quality (CEQ) issued draft guidance with respect to the consideration of global climate change.³ Although apparently never finalized, the draft guidance demonstrates an early recognition that NEPA could become a tool for addressing the impact of global climate change. Over the years, as global climate change has become an issue of concern, both nationally and

¹ 42 U.S.C. § 4332(A).

² See e.g. Draft Memorandum from Kathleen A. McGinty, Chairman, Council on Environmental Quality, Executive Office of the President, *Guidance Regarding Consideration of Global Climatic Change in Environmental Documents Prepared Pursuant to the National Environmental Policy Act* [hereinafter *Draft Guidance*] available at <http://www.mms.gov/eppd/compliance/nepa/procedures/climate/considerations.htm>.

³ *Id.*

globally, NEPA litigation has ensued regarding global climate change.

In the Supreme Court's landmark decision of *Massachusetts v. EPA*,⁴ greenhouse gases, specifically carbon dioxide, were recognized as pollutants under the Clean Air Act with the potential to cause cognizable environmental damage in the form of global climate change.⁵ Most recently in *Center for Biological Diversity v. National Highway Traffic Safety Administration (Center for Biological Diversity)*,⁶ the Ninth Circuit held that "[t]he impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct."⁷ With this extremely broad holding, federal agencies must now ensure that sufficient analysis is conducted on the issue of global climate change. The Ninth Circuit left unanswered many questions, including the appropriate scope of the cumulative impacts analysis and how to determine the significance of the impact of an agency action on global climate change.⁸

⁴ *Massachusetts v. EPA*, 127 S.Ct. 1438, 162 L.Ed.248 (2007).

⁵ *See, Id.*

⁶ 508 F.2d 508 (9th Cir Nov 15, 2007).

⁷ *Id.* at 550.

⁸ *See generally, Id.*

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As a result of these recent developments in the law, in conjunction with the truly global nature of the global climate change issue, federal agencies are left with substantial uncertainty with regard to what will constitute adequate NEPA analysis. Standards that agencies can apply for the purposes of determining the appropriate scope of analysis to evaluate project significance for purposes of NEPA simply do not exist with respect to global climate change impacts. Notwithstanding the difficulties associated with the issue, federal agencies could utilize a strategy that may provide some certainty. By presuming that that any greenhouse gas emissions above some *de minimis* level meets the threshold of significance, federal agencies could implement mitigation strategies or acquire offsets to reduce emission levels below the *de minimis* standard.

This paper will provide a survey of the current requirements under the law for addressing global climate change in NEPA documents, along with various methodologies for quantifying the potential global climate change impacts of federal actions subject to NEPA. Section II provides a short nonscientific overview of global climate change, along with the goals and requirements of NEPA generally. Section III surveys the recent developments in the case law

dealing with global climate change and NEPA, specifically addressing the holdings of *Center for Biological Diversity* with respect to NEPA and global climate change. This section also summarizes the law with respect to the analysis of cumulative impacts on global climate change in NEPA documents. Section IV addresses the practical implications of the holding in *Center for Biological Diversity* and the difficulties associated with conducting an analysis of global climate change impacts consistent with the ruling of the Ninth Circuit. Particular attention will be paid to the difficulties associated in establishing geographic boundaries with respect to global climate change impacts during scoping, coupled with the lack of any established baseline or threshold of significance. The difficulties associated with these areas illustrate why global climate change is not suited to NEPA analysis in the manner apparently required by *Center for Biological Diversity* absent the adoption of standards to facilitate the analysis. Section V will examine utilizing the net-zero threshold as the standard for making significance determinations under NEPA with respect to global climate change impacts.

II. BACKGROUND

1. Global Climate Change

For many years, scientists and policy makers have been discussed the overall impact greenhouse gas emissions have on the environment. While scientists studied the issue, governments at all levels in the United States, the governments of other nations, global and regional organizations of governments, and non-governmental organizations (NGO's) have debated what should to do about the conclusions that the scientists reached.⁹ Over the last decade, several significant events have changed the debate from whether humans are having an impact on the earth's climate to one of how human impact on the global climate should be addressed.

While much of the interest in the global climate change is recent, as early as 1896 Svante Arrhenius, a Swedish scientist, studied the potential impact that carbon dioxide might have on global temperatures.¹⁰ In 1940, G.S. Callender came to the conclusion that fossil fuel combustion might lead to increases in atmospheric carbon

⁹ See generally, Arnold Reitze, *Global Warming*, 31 E.L.R. 10253 (2001).

¹⁰ See, *Id.*, at 10253 citing JOHN HOUGHTON, *GLOBAL WARMING: THE COMPLETE BRIEFING* 12 (2d ed 1997).

dioxide that could cause an increase in global temperatures by 10 degrees Fahrenheit.¹¹ In 2007, the International Panel on Climate Change (IPCC) issued its most recent assessment regarding the subject.¹² The IPCC concluded, "warming of the climate system is unequivocal."¹³ With respect to causes of the warming, "[m]ost of the observed increase in globally-averaged temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic [greenhouse gas] concentrations."¹⁴

Pursuant to the United Nations Framework Convention on Climate Change, carbon dioxide, methane, nitrous oxide, hydroflourocarbons, perfluorocarbons, and sulfur hexaflouride are the greenhouse gases that are generally monitored and evaluated.¹⁵ The potency of a greenhouse gas is expressed by its global warming potential (GWP). The baseline used to establish GWP is carbon dioxide, the most

¹¹ See Reitze, *supra* note 9 at 10253 citing GLOBAL WARMING: THE COMPLETE BRIEFING at 12.

¹² See generally, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE FOURTH ASSESSMENT REPORT, CLIMATE CHANGE 2007: SYNTHESIS REPORT-SUMMARY FOR POLICY MAKERS (2007) (*hereinafter* IPCC SUMMARY).

¹³ IPCC Summary, *supra* note 12 at 1.

¹⁴ *Id.*, at 2 (emphasis in original).

¹⁵ *Id.*, at note 5.

abundant of the greenhouse gases, with a GWP of 1.¹⁶ Once emitted, greenhouse gases accumulate in the atmosphere for decades and do not remain confined regionally, circling the earth without dissipating.¹⁷ Because of the global nature of greenhouse gases along with the lack of dissipation, greenhouse gases present significant cumulative impact concerns.¹⁸ While the source of the increase with respect to greenhouse gas concentrations cannot be attributed solely to human activity, "[g]lobal atmospheric concentrations of carbon dioxide, methane (CH₄) and nitrous oxide (N₂O) have increased markedly as a result of human activities."¹⁹ In the United States alone, greenhouse gas emissions showed an overall increase of 16.3% between the years 1990 and 2005.²⁰ Looking only at energy related emissions of carbon dioxide in the United States, using the residential, commercial, industrial and transportation end-use sectors, shows an increase in carbon dioxide emissions from 2183.9 million metric tons in 1949 to 5981.6 million

¹⁶ See generally, GLOBAL CLIMATE CHANGE AND U.S. LAW 5 (Michael B. Gerrard ed., A.B.A. 2007).

¹⁷ *Id.* at 5-6.

¹⁸ *Id.*

¹⁹ *Id.* at 4.

²⁰ ENVIRONMENTAL PROTECTION AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2005 (2007) [*hereinafter* INVENTORY].

metric tons in 1995.²¹ United States' greenhouse gas emissions represent approximately 20% of the world total.²²

The potential impacts of global climate change are varied. Some of the demonstrated impacts of rising global temperatures include rising sea levels, decreases in snow and ice, and changes in precipitation patterns.²³ The projected impacts of global climate change include increased warming over the high northern latitudes, the contraction of snow cover area and increasing thaw depth of permafrost regions, increasing extremes of heat, a likely increase in tropical cyclone activity, and further adjustment of precipitation patterns.²⁴ In addition to the already observed and projected general impacts, the IPCC has made projections for different regions of the world. The projections with respect to North America are as follows:

* Warming in Western mountains is projected to cause decreased snowpack, more winter flooding, and reduced summer flows, exacerbating competition for over-allocated water resources.

²¹ Energy Information Administration, *(CO2) History from 1949*, available at <http://www.eia.doe.gov/environment.html>.

²² See Energy Information Administration, *Regional Shares of World Carbon Dioxide Emissions 1990, 2004, 2020, and 2030*, available at <http://www.eia.doe.gov/oiaf/1605/ggrpt/#global>.

²³ IPCC Summary, *supra* note 12 at 1.

²⁴ *Id.*, at 8.

* In the early decades of the century, moderate climate change is projected to increase aggregate yields of rain-fed agriculture by 5-20%, but with important variability among regions. Major challenges are projected for crops that are near the warm end of their suitable range or which depend on highly utilized water resources.

* During the course of this century, cities that currently experience heatwaves are expected to be further challenged by an increased number, intensity and duration of heatwaves during the course of the century, with potential for adverse health impacts.

* Coastal communities and habitats will be increasingly stressed by climate change impacts interacting with development and pollution.²⁵

Just as it is clear that many scientists have determined that human activities are contributing to global climate change and the negative impacts associated with it, it has also become increasingly clear that some level of analysis of global climate change is required under NEPA.

2. NEPA Overview

With the passage of NEPA in 1969, Congress recognized that it would be the policy of the United States

to use all practicable means and measures . . . in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social,

²⁵ IPCC Summary, *supra* note 12 at 10, Table SPM2.

economic, and other requirements of present and future generations of Americans.²⁶

In order to effectuate this policy, Congress required that the Federal Government prepare a detailed statement on the environmental impacts of "major Federal actions significantly affecting the quality of the human environment."²⁷ It is clear from the statute itself that NEPA is meant to require federal agencies to consider the impacts of its actions on the environment. NEPA has been interpreted to provide only procedural requirements, and not to create any substantive requirements.²⁸ NEPA simply requires that federal agencies take "a 'hard look' at environmental consequences."²⁹ Upon conducting the required analysis, NEPA does not mandate any particular choice of actions; an agency is free to choose the most environmentally destructive alternative.³⁰

CEQ developed the implementing regulations for NEPA, which provide guidance for achieving NEPA compliance.³¹ An

²⁶ 42 U.S.C. §4331(a).

²⁷ 42 U.S.C. §4332(C).

²⁸ See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332 (1989).

²⁹ *Kleppe v. Sierra Club*, 427 U.S. 390, 410 note 21 (1976).

³⁰ See *Robertson v. Methow Valley*, *supra* note 26 at 350.

³¹ See 40 C.F.R. Pt 1500 *et seq.*

agency considering a "major federal action significantly affecting the human environment"³² must complete an environmental impact statement (EIS) defined as the "detailed written statement as required by section 102(2)(C) of the Act".³³ In instances where an agency action is neither the type of action that normally requires an EIS nor one that is categorically excluded from the need for an EIS, a federal agency is required to prepare an environmental assessment (EA).³⁴

In determining whether an action significantly affects the human environment, an agency must consider the direct effects of the action along with the indirect effects of the action.³⁵ Agencies must also consider "whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment."³⁶ The fact that the definition of "significance" within the

³² See 40 C.F.R. pt 1508.

³³ 40 C.F.R. § 1508.11.

³⁴ 40 C.F.R. § 1501.4(b). An EA is defined in 40 C.F.R §1508.10 as a document that assists an agency in making a determination whether an EIS is required or to demonstrate compliance with NEPA in instances where an EIS is not required.

³⁵ 40 C.F.R. § 1508.8

³⁶ 40 C.F.R. § 1508.27(b)(7).

regulations includes cumulative impacts may create a fairly expansive requirement for federal agencies conducting environmental analyses. Cumulative impact is defined as:

The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.³⁷

Oftentimes, determining the proper scope of a cumulative impacts analysis can be the most difficult aspect of complying with the cumulative impacts requirement.

"Analyzing cumulative effects is . . . challenging, primarily because of the difficulty of defining the geographic (spatial) and time (temporal) boundaries."³⁸

With respect to a cumulative impacts analysis, the differences between an EA and an EIS may not be substantial. While the level of specificity included within an EA is not required to be to that of an EIS, an EA must in some instances include a cumulative impacts

³⁷ 40 C.F.R. § 1508.7

³⁸ COUNCIL ON ENVIRONMENTAL QUALITY, EXECUTIVE OFFICE OF THE PRESIDENT, *CONSIDERING CUMULATIVE EFFECTS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT* [hereinafter *CUMULATIVE EFFECTS HANDBOOK*] V (January 1997).

analysis.³⁹ This determination, in *Native Ecosystems Council v. Dombeck*,⁴⁰ is supported by a CEQ interpretation, which provides that "[g]iven that so many more EA's are prepared than EIS's, adequate consideration of cumulative effects requires that EA's address them fully."⁴¹ Unfortunately, as will be discussed more fully in Section III, performing an adequate cumulative impacts analysis of global climate change impacts may prove to be extremely difficult due to a variety of factors.

3. Past Consideration of Global Climate Change Under NEPA

Although the results of recent litigation have altered the manner that global climate change will be addressed in future NEPA analyses, considering global climate change in NEPA analysis is not a new concept. Various guidance documents either explicitly or implicitly recognize the need to consider global climate change under NEPA. Some agencies, in fact, already consider global climate change under NEPA. A brief survey of the guidance and the manner that some agencies address global climate change

³⁹ *Native Ecosystems Council v. Dombeck*, 304 F.3d 886, 895 (9th Cir. 2002).

⁴⁰ *Id.* at 886.

⁴¹ CUMULATIVE EFFECTS HANDBOOK, *supra* note 38 at 4.

demonstrates the difficulty of including this topic in NEPA analyses.

There is no final CEQ guidance on the consideration of global climate change in NEPA planning. In 1997, a draft document was circulated to federal agencies with proposed guidance on the consideration of global climate change under NEPA.⁴² Although never finalized, the existence of the draft guidance indicates that global climate change has certainly been the subject of NEPA consideration in the past. The proposal cited research from the IPCC as demonstrating the reasonably foreseeable impact of greenhouse gas emissions on the human environment and thus the requirement for NEPA analysis.⁴³ Under the proposal, an agency would be required to consider how a federal action could impact global climate change as well as how global climate change could impact federal actions.⁴⁴ The proposal provides that because of the minimal impact that individual projects may have on global climate change, consideration of global climate change at the individual project level would not be useful, rather, consideration of global climate change on the programmatic level would be more

⁴² See, *Draft Guidance*, *supra* note 2.

⁴³ *Id.*, at 4.

⁴⁴ *Id.*, at 5.

appropriate.⁴⁵ Despite this focus on a more programmatic analysis, the proposal did prophetically recognize "that individual projects may increase greenhouse gas emissions by only marginal amounts, but that the cumulative effect of such emissions could be more dramatic."⁴⁶

CEQ has published a handbook regarding the consideration of cumulative effects under NEPA,⁴⁷ although the handbook itself does not constitute formal guidance with respect to cumulative effects analysis.⁴⁸ While the handbook is directed toward cumulative effects generally, it does recognize that analysis of the cumulative impacts of agency actions on climate may be appropriate. "The analyst should begin by evaluating the existing resources likely to be cumulatively affected, including one or more of the following: soils, geology and geomorphology, climate and rainfall, . . . within the area of expected project effects."⁴⁹ Consistent with the draft guidance and handbook, it appears that any specific analysis of global

⁴⁵ *Draft Guidance*, *supra* note 2 at 5-6.

⁴⁶ *Id.*

⁴⁷ *See generally*, CUMULATIVE EFFECTS HANDBOOK, *supra* note 38.

⁴⁸ *Id.*, at vi.

⁴⁹ CUMULATIVE EFFECTS HANDBOOK, *supra* note 38 at 24.

climate change being conducted was done at the programmatic level.

The Department of Energy (DOE) has historically attempted to include some discussion of global climate change impacts in NEPA documents. "In the late 1980s, for example, DOE's *Clean Coal Technology Program Final Programmatic Environmental Impact Statement* (DOE/EIS-0146) projected the incremental and cumulative emissions of carbon dioxide expected to result from commercialization of clean coal technologies."⁵⁰ Any significant discussion related to global climate change has been limited to projects where potential greenhouse gas emissions would be large.⁵¹ Much of the difficulty in analyzing the impacts of greenhouse gases on global climate change lies in the difficulty of determining the significance of those impacts and not in estimating the total amount of emissions.⁵² DOE's own internal guidance⁵³ requires an assessment of the

⁵⁰ Eric Cohen, *Consideration of Greenhouse Gas Emissions in DOE NEPA Documents is Evolving*, National Environmental Policy Act Lessons Learned, U.S. DEPT. ENERGY Q. REP. Dec. 3, 2007, at 1.

⁵¹ *Id.*, at 6.

⁵² *Id.*

⁵³ DOE's guidance document is *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements* ("Green Book") (December 2004) available at <http://www.eh.doe.gov/nepa/tools/guidance/volumeii.htm>.

potential effects of the release of pollutants.⁵⁴ This has generally resulted in utilizing a comparison of the emissions levels as a percentage of global emissions.⁵⁵ By utilizing this type of global comparison, a federal agency would likely always be able to avoid a significance determination with respect to global climate change for all but the largest programmatic analyses. "Since any single project is likely to have only a small impact on total world emissions, an agency can almost always argue that the impacts are not significant."⁵⁶ As recent case law has addressed incorporating global climate change in NEPA analyses, federal agencies are now likely required to provide more in depth consideration of global climate change for smaller and more discrete projects.

III. Recent Litigation

Although much of the recent press surrounding global climate change in the courts has dealt with the landmark decision of *Massachusetts v. EPA*, there have been multiple efforts on the part of certain NGO's to utilize NEPA as a means of addressing global climate change. While the success was initially limited, utilizing NEPA as a means to

⁵⁴ *Green Book*, *supra* note 53 at 20.

⁵⁵ Cohen, *supra* note 50 at 4.

⁵⁶ GLOBAL CLIMATE CHANGE AND U.S. LAW, *supra* note 16 at 217.

require federal agencies to analyze global climate change impacts has clearly developed into a viable challenge in the courts. This line of cases culminated recently with *Center for Biological Diversity*.

1. *City of Los Angeles v. NHTSA*

One of the very early attempts to bring global climate change under the umbrella of NEPA analysis occurred in *City of Los Angeles v. NHTSA*.⁵⁷ Various NEPA challenges were raised by both private and public entities regarding the NHTSA proposed CAFE standards for the 1987-1988 model years. The NRDC, however, raised a challenge to the proposed standards alleging that "NHTSA should have prepared an EIS to consider the adverse climatic effects of the increase in fossil fuel consumption that would result from setting a CAFE standard lower than 27.5 mpg."⁵⁸ The court ultimately did not find that the NHTSA was required to prepare an EIS to consider the climatic impacts of the rule. In an unusual decision with respect to that issue, the only lengthy discussion on the merits of NRDC's claim is found in a dissenting opinion.⁵⁹

⁵⁷ See, *City of Los Angeles v. National Highway Traffic Safety Administration et al*, 912 F.2d. 478 (D.C. Cir. 1990).

⁵⁸ *Id.*, at 483.

⁵⁹ See *City of Los Angeles v. NHTSA*, *supra* note 57. (Two of the judges on the panel determined that NRDC had standing to make the NEPA

The NHTSA had conducted an EA with regard to the rulemaking effort and "concluded that its rollback from 27.5 mpg to 26.5 mpg would not have a 'significant' effect on global warming."⁶⁰ The agency had calculated the projected total amount of increased carbon dioxide emissions resulting from the proposed change and determined that the increase would represent less than 1% of global carbon dioxide emissions.⁶¹ In reasoning that appears to ultimately have influenced the court in *Center for Biological Diversity*, Judge Wald rejected the conclusions drawn by NHTSA in a dissenting opinion. NHTSA drew what the dissent believed was a conclusion "[w]ithout some articulated criteria for significance in terms of contribution to global warming that is grounded in the record and available scientific evidence."⁶² Because most increases in emissions attributable to federal projects will seem minimal when compared to global carbon dioxide emissions, some objective criteria should be used. "[T]he comparative smallness of an injurious release is not always

challenge. Of those two, however, only one found on the merits that NHTSA had failed to satisfy NEPA).

⁶⁰ *Id.*, at 499.

⁶¹ *Id.*, at 500.

⁶² *Id.*, at 500.

sufficient by itself to foreclose the necessity for an EIS."⁶³ The dissent also, very briefly, pointed out the inadequate analysis of the cumulative impacts of the agency action.⁶⁴

While not yielding any lasting law with respect to NEPA and global climate change, the dissenting opinion clearly outlines what became two of the most significant issues with respect to global climate change and NEPA. Federal agencies can make calculations with regard to the projected increase in greenhouse gases resulting from projects. In the absence of accepted baseline references and thresholds, however, federal agencies often determine significance in relation to total global emissions.⁶⁵ The other significant issue for federal agencies with respect to global climate change, as *Center for Biological Diversity* ultimately held, concerns the requirement to consider the cumulative impacts of global climate change under NEPA.

⁶³ *City of Los Angeles v. NHTSA*, *supra* note 57 at 501 *citing* *Foundation on Economic Trends v. Heckler*, 756 F.2d 143, 153 (D.C. Cir. 1985).

⁶⁴ *Id.* at 501.

⁶⁵ See e.g., *Center for Biological Diversity v. NHTSA*, *supra* note 6; see also *Cohen*, *supra* note 50.

2. *Mid States Coalition for Progress v. Surface Transportation Board*

Although the dissent in *City of Los Angeles* highlighted a concern regarding the sufficiency of cumulative impacts, the next significant case with implications for global climate change analysis under NEPA focused on secondary impacts. In *Mid States Coalition for Progress v. Surface Transportation Board* (*Mid States Coalition*), the Eighth Circuit dealt with various NEPA challenges to a proposal to build additional rail lines and upgrade existing track to access coal mines in Wyoming.⁶⁶ Among the challenges raised in that case, the Sierra Club argued that there was a failure "to consider the effects on air quality that an increase in the supply of low-sulfur coal to power plants would produce."⁶⁷ While the Sierra Club challenge apparently focused on pollutants regulated under the Clean Air Act such as nitrous oxide, particulates, and mercury, the Sierra Club also raised the prospect of additional carbon dioxide emissions.⁶⁸

⁶⁶ See, *Mid States Coalition for Progress v. Surface Transportation Board*, 345 F.3d. 520 (8th Cir. 2003).

⁶⁷ *Id.*, at 548.

⁶⁸ *Id.*

As part of the overall result requiring further NEPA analysis of the proposed action, the court required the Surface Transportation Board (Board) to consider the potential impacts that the rail line might have on air emissions, including carbon dioxide.⁶⁹ The Court's analysis of this challenge focused on the need to assess secondary impacts of a federal action. Finding that the increased availability of coal sources would have some impact on coal demand⁷⁰, the court focused on whether this would constitute a reasonably foreseeable secondary impact.⁷¹ After examining the language found in both the statute and the CEQ regulations, the court concluded that the language in both sources "leaves little doubt that the type of effect at issue here, degradation in air quality, is indeed something that must be addressed in an EIS if it is 'reasonably foreseeable.'"⁷² Significantly, the court highlighted the provisions of the CEQ regulations found at 40 C.F.R. §1502.22 that provide a mechanism to address

⁶⁹ Mid States Coalition v. Surface Transportation Board, *supra* note 66 at 550.

⁷⁰ *Id.*, at 549.

⁷¹ *Id.*

⁷² *Id.*, at 549-550.

situations where "the nature of the effect is reasonably foreseeable but its extent is not."⁷³

Following the remand, the Board conducted an analysis of the air impacts. In *Mayo Foundation v. Surface Transportation Board (Mayo Foundation)*,⁷⁴ the Sierra Club raised a challenge to the sufficiency of the analysis regarding the air impacts resulting from increased use of coal. In conducting its analysis, the Board was able to quantify the impacts associated with the increase at the national and regional level; however, local impacts were not quantifiable resulting in the Board using the provisions of 40 C.F.R. § 1502.22.⁷⁵ The court determined that the "Board more than adequately considered the 'reasonably foreseeable significant adverse effects [of increased coal consumption] on the human environment' on remand."⁷⁶

Mid States Coalition and *Mayo Foundation* clearly illustrate the need for federal agencies to consider global

⁷³ *Mid States Coalition v. Surface Transportation Board*, *supra* note 66 at 550.

⁷⁴ *Mayo Foundation v. Surface Transportation Board* 472 F.3d 545 (8th Cir. 2006).

⁷⁵ *Id.* at 555.

⁷⁶ *Id.* at 556.

climate change impacts in the course of NEPA analyses. The combined effect of the cases is interesting because the required consideration of carbon dioxide arose based upon a challenge from the Sierra Club that the Board had failed to consider increases in "the emissions of other noxious air pollutants such as . . . carbon dioxide . . ."⁷⁷ At the time of the challenge, however, carbon dioxide had not been determined by either the EPA or any court to be a pollutant under the Clean Air Act.⁷⁸ The two cases are also limited in their usefulness regarding NEPA and global climate change because the project that was the subject of the challenge was already subject to an EIS rather than an EA to determine if an EIS was necessary. As such, they do not illustrate what might constitute a sufficient level of analysis in the context of an EA.

3. *Border Power Plant Working Group v. Department of Energy*

Similar to the result in *Mid States Coalition, supra*, in *Border Power Plant Working Group v. Department of Energy (Border Power)* a California District Court found NEPA

⁷⁷ *Mid States Coalition v. Surface Transportation Board, supra* note 66 at 548.

⁷⁸ See e.g. *Massachusetts v EPA, supra* note 4.

analysis inadequate with respect to carbon dioxide.⁷⁹ In *Border Power*, various challenges were raised against the issuance of permits and rights of way allowing utilities to connect Mexican power plants with California.⁸⁰ The specific challenge raised with regard to global climate change was that the agency did not include any analysis of carbon dioxide emissions in its EA.⁸¹

The court's finding with respect to carbon dioxide emissions was not remarkable with regard to its legal reasoning; "[b]ecause these emissions [carbon dioxide and ammonia] have potential environmental impacts and were indicated by the record, the Court finds that the EA's failure to disclose and analyze their significance is counter to NEPA."⁸² This issue was interesting because the court rejected the arguments put forward by the agencies. The federal agencies in *Border Power* asserted that since carbon dioxide was not listed as a hazardous or toxic pollutant by the federal government or California they were

⁷⁹ See *Border Power Plant Working Group v. Department of Energy*, 467 F.Supp. 2d. 1040 (S.D.Cal. 2006).

⁸⁰ *Id.*

⁸¹ *Border Power v. Dept. of Energy*, *supra* note 79 at 1028.

⁸² *Id.* at 1029.

not arbitrary and capricious in omitting an analysis.⁸³ In rejecting this argument made by the federal agencies, the court found that carbon dioxide must be analyzed because of its potential impacts on global climate change as a greenhouse gas. This appears to be a step further than the court went in *Mid States Coalition*, since that court found that carbon dioxide was included in the potential emissions that must be analyzed in terms of air quality impacts.⁸⁴ Additional challenges were raised by the plaintiffs in *Border Power* relating to the cumulative impacts analysis contained in the EA.⁸⁵ From the court's opinion, it does not appear that plaintiff's alleged that a cumulative impacts analysis of the impacts of carbon dioxide emissions would be required. While it is possible that the complete absence of any discussion of the impacts of carbon dioxide emissions placed that contention out of reach at the time, the omission is interesting in light of the ultimate decision in *Center for Biological Diversity*.

⁸³ *Border Power v. Dept. of Energy*, *supra* note 79 at 1028.

⁸⁴ *Mid States Coalition v. Surface Transportation Board*, *supra* note 66 at 550.

⁸⁵ *Border Power v. Dept. of Energy*, *supra* note 79 at 1032.

4. *Massachusetts v. EPA*

Although *Massachusetts v. EPA* was not a case involving NEPA, some attention must be given to the Supreme Court's decision on the merits of the question regarding carbon dioxide being a pollutant capable of regulation under the Clean Air Act.⁸⁶ The case involved a petition denied by the EPA requesting a rule making on the regulation of greenhouse gases from motor vehicle emissions under the Clean Air Act.⁸⁷ In addition to a unique holding with respect to standing issues,⁸⁸ the Court determined that greenhouse gases were pollutants under the Clean Air Act.⁸⁹ The Court went on to hold that the EPA must regulate greenhouse gases unless "it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do."⁹⁰

⁸⁶ See *Massachusetts v. EPA*, *supra* note 4.

⁸⁷ *Id.*, at 1446-1447.

⁸⁸ For a full discussion of the significance of the holding, see Arnold Reitze, *Controlling Greenhouse Gas Emissions from Mobile Sources—Massachusetts v. EPA*, E.L.R. 10535 (2007).

⁸⁹ *Mass v. EPA*, *supra* note 4 at 1462.

⁹⁰ *Id.*

The Supreme Court determination that greenhouse gases fall within the definition of pollutants under the Clean Air Act is significant for the purposes of NEPA analysis because it supports the *Border Power* court's rejection of federal agency arguments that carbon dioxide need not be analyzed under NEPA because it is not a listed pollutant.⁹¹ Following *Massachusetts v. EPA*, federal agencies are no longer left with the question regarding whether a project that will yield an increase in greenhouse gases has in impact on the environment; rather the agencies are left with a determination as to how to go about analyzing the impact and whether those impacts rise to a level of significance requiring an EIS.

5. *Center for Biological Diversity v. National Highway Transportation Safety Board*

Following the holding in *Massachusetts v. EPA* along with the line of cases dealing with global climate change and NEPA, federal agencies must consider the impacts of greenhouse gas emissions resulting from major federal actions. Further, based upon the holding in *Mid States Coalition, supra*, an agency has an obligation to consider the indirect impacts of those actions, as well as the direct impacts in the form of increased emissions of

⁹¹ *Border Power v. Dept. of Energy, supra* note 79 at 1028-1029.

greenhouse gases.⁹² For most federal actions involving discrete projects, however, the actual direct and foreseeable indirect greenhouse gas emissions attributable to the project are likely to be quite small in relation to either global emissions or even total U.S. emissions.⁹³ Despite the relatively small quantity of greenhouse gas emissions associated with many federal projects, the decision in *Center for Biological Diversity* requires a federal agency to quantify the direct, indirect, and cumulative impacts of a proposed action in order to determine whether the emissions generate a significant impact on the human environment.⁹⁴

The NHTSA issued a final rule regarding light truck CAFE standards for MY's 2008-2011.⁹⁵ One of the various challenges raised included whether the "NHTSA's Environmental Assessment is inadequate under NEPA because it fails to take a 'hard look' at the greenhouse gas implications of its rulemaking and fails to analyze a

⁹² See, *Border Power v. Dept. of Energy*, *supra* note 79.

⁹³ See generally, Cohen *supra* note 50, see also Steven G. Jones, *Assessing Climate Change: Evaluating Global Warming Impacts under NEPA and State Environmental Review Statutes*, 12 (Dec 13, 2007) available at <http://martenlaw.com>.

⁹⁴ See, *Center for Biological Diversity v. NHTSA*, *supra* note 6.

⁹⁵ *Id.* at 513.

reasonable range of alternatives or examine the rule's cumulative impact."⁹⁶ Because of how the issue was framed, the Ninth Circuit addressed an issue that had yet to be directly addressed in either *Border Power, supra* or *Mid States Coalition, supra*; whether the cumulative impacts of greenhouse gas emissions were subject to NEPA analysis.

In evaluating the petitioner's claim, the court first held that while this matter had been disposed of pursuant to an EA rather than an EIS, "an EA may be deficient if it fails to include a cumulative impact analysis"⁹⁷ Having determined that a cumulative impacts analysis may be required in an EA, the court next turned to whether the cumulative impacts of greenhouse gas emissions were required under NEPA and, if so, whether the agency had conducted a satisfactory analysis.⁹⁸ With regard to the first question, the court looked to the definition of cumulative impacts found in the regulations, which provide that a cumulative impact is:

⁹⁶ Center for Biological Diversity v. NHTSA, *supra* note 6 at 514.

⁹⁷ *Id.* at 548 quoting *Native Ecosystems v. Dombeck*, 304 F.2d 886, 895 (9th Cir. 2002).

⁹⁸ See Center for Biological Diversity v. NHTSA, *supra* note 6 at 548-550.

[t]he impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency ... or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.⁹⁹

Using this definition, the court held that "[t]he impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct."¹⁰⁰ While previous draft CEQ guidance provided that NEPA analysis of global climate change would be of limited usefulness below the programmatic level,¹⁰¹ the Ninth Circuit's decision includes no such limitation. It would appear that federal agencies must consider the cumulative impacts of an action on global climate change for all projects.

Having determined that global climate change impacts are subject to cumulative impact analysis under NEPA, the court moved to the second question concerning whether the agency had sufficiently considered the cumulative impacts of the action. The federal agency had done some evaluation

⁹⁹ Center for Biological Diversity v. NHTSA, *supra* note 6 at 548 quoting 40 C.F.R. § 1508.7.

¹⁰⁰ *Id.* at 549.

¹⁰¹ *Draft Guidance, supra* note 2.

of the greenhouse gas impacts of the proposed rule. The court noted that "[w]hile the EA quantifies the expected amount of CO2 emitted from light trucks MY's 2005-2011, it does not evaluate the 'incremental impact' that these emissions will have on climate change or on the environment more generally in light of other past, present, and reasonably foreseeable actions. . . ." ¹⁰² In finding that the agency's totaling of carbon dioxide emissions without further analysis was insufficient, the court pointed to recent NEPA case law where a cumulative impacts analysis was deemed insufficient because "stating the total miles of roads to be constructed is similar to merely stating the sum of the acres to be harvested-it is not a description of the *actual* environmental effects." ¹⁰³

In addition to pointing out that the EA had merely calculated the total amount of emissions without sufficient evaluation, the court highlighted that the extent of the analysis requires consideration of actions outside of the individual project. "The cumulative impacts regulation specifically provide that the agency must assess the 'impact of the action when added to other past, present,

¹⁰² Center for Biological Diversity v. NHTSA, *supra* note 6 at 549.

¹⁰³ *Id.*, citing Kamath-Siskiyou Wildlands Center v. Bureau of Land Management, 387 F.3d 989, 995 (9th Cir. 2004) [emphasis in original].

and reasonably foreseeable future actions *regardless of what agency (Federal or non-federal) or person undertakes such other actions.*'"¹⁰⁴ Utilizing this strict reading of the regulation the court ordered that the agency must provide adequate analysis of the cumulative impacts consistent with that strict definition.¹⁰⁵

Rather than remanding the issue back to the agency to enable it to evaluate the cumulative impacts of the rule consistent with 40 C.F.R. 1508.7, the court used the insufficient analysis of cumulative impacts contained in the EA to order the agency to complete an EIS.¹⁰⁶ As detailed in Section II *supra*, an agency must complete an EIS for major federal actions significantly impacting the human environment.¹⁰⁷ Case law has expanded the clear wording of this provision by requiring the preparation of an EIS if there are substantial questions regarding the significance of the impact on a federal action.¹⁰⁸ In its EA, the federal

¹⁰⁴ Center for Biological Diversity v. NHTSA, *supra* note 6 at 550, citing 40 C.F.R. § 1508.7 [emphasis in original].

¹⁰⁵ *Id.* at 550.

¹⁰⁶ *Id.* at 552.

¹⁰⁷ 42 U.S.C. §4332(C).

¹⁰⁸ Center for Biological Diversity v. NHTSA, *supra* note 6 at 552-553, citing Idaho Sporting Cong. V. Thomas, 137 F.3d 1146, 1149-1150 (9th Cir 1998.)

agency made a finding of no substantial impact based upon the conclusion that "the final rule would produce, compared to U.S. emissions of CO₂, a small decrease in emissions of CO₂, the primary component of greenhouse gas emissions, under the selected alternative."¹⁰⁹

In rejecting the agency conclusion regarding significance as arbitrary and capricious,¹¹⁰ the court appears to focus on the absence of an adequate discussion of the impacts of the action on climate change.¹¹¹ Why the court was able to make a determination of significance utilizing what it had determined to be an insufficient analysis of cumulative impacts is unclear, however, the result has far reaching implications. The Ninth Circuit, citing the dissenting opinion of Chief Judge Wald in *City of Los Angeles, supra*, requires an agency to not only calculate the greenhouse gas emissions from a particular project, but also to compare those emissions to some articulated criteria for significance.¹¹² Given that the Ninth Circuit appears to have rejected the agency's

¹⁰⁹ Average Fuel Economy Standards for Light Trucks Model Years 2008-2011, Final Rule, 71 Fed Reg 17,566, 17,673 (2006).

¹¹⁰ Center for Biological Diversity v. NHTSA, *supra* note 6 at 554.

¹¹¹ See *Id.*, at 556-557.

¹¹² *Id.*, at 558.

comparison of the projects greenhouse gas emission rates as a percentage of the total U.S. emission rates in evaluating significance, federal agencies considering projects with potential impacts on global climate change within the Ninth Circuit must go further than simply calculating the total emissions resulting from the project. Federal agencies should calculate all impacts including the cumulative impacts and evaluate them in reference to something other than a percentage of total U.S. emissions of greenhouse gases.

IV. ANALYSIS REQUIREMENTS FOLLOWING *CENTER FOR BIOLOGICAL DIVERSITY*

The case law illustrates that federal agencies will be required to consider global climate change during the course of its NEPA process. Following the decision in *Center for Biological Diversity*, the manner in which federal agencies consider the impacts of an action with respect to global climate change are certainly more defined than they had been in the past. Federal agencies must be prepared to quantify their global climate change impact, which is normally done in the context of quantifying greenhouse gas emissions. The efforts to quantify the impacts must account for direct and indirect impacts along with the cumulative impacts of the proposed action.

Finally, in instances where a federal agency is preparing an EA, in order to determine significance it appears that a comparison of the projects emissions as a percentage of total U.S. emissions will likely be unsatisfactory.

While the facts of *Center for Biological Diversity* illustrate that federal agencies have included global climate change impacts within NEPA analyses, the results of the case pose several areas of uncertainty for federal agencies due to the absence of any accepted standards regarding global climate change. With regard to quantification, an issue arises with respect to determining what emissions to count. Once a federal agency determines what emissions to quantify, several issues arise with regard to conducting the cumulative impacts analysis. The issues include establishing a geographical and temporal boundary for the analysis. After determining what emissions to quantify and the scope of the analysis, federal agencies are left with issues regarding a determination of their significance.

1. Quantification of Global Climate Change Impacts.

Potentially the easiest of the three requirements arising from *Center for Biological Diversity* for federal agencies to meet is the requirement to quantify the global

climate change impacts of a federal action under NEPA. As referenced in Section II *supra*, "[m]ost of the observed increase in globally-averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations."¹¹³ Based upon this belief, federal agencies may quantify the global climate change impact of an action by quantifying the greenhouse gas emissions attributable to the project.

Various methodologies exist for actually quantifying the emissions attributable to a project. "There are a number of sources for methods by which GHG emissions from a project can be estimated, as follows: The California Climate Action Registry protocol (CCAR 2007); URBEMIS2007; EPA factors (EPA 204, EPA 2004b, EPA 1998, EPA 2004d); and the U.S. Energy Information Administration (EIA 2007)."¹¹⁴ While methodologies for developing calculations do exist, there is little guidance to determine what to incorporate into the calculations.

¹¹³ See IPCC SUMMARY *supra* note 12 at 5 [emphasis in original].

¹¹⁴ Michael Hendrix, et. al., Alternative Approaches to Analyzing Greenhouse Gas Emission and Global Climate Change in CEQA Documents Final, 16 (June 29, 2007) available at www.csac.counties.org/images/public/Advocacy/ag_natres/AEP_Global_Climate_Change_June_29_Final%5B1%5D.pdf.

Determining what sources of greenhouse gases to include in the calculations of emissions attributable to a project may not be an easy one. NEPA regulations require the consideration of direct, indirect, and cumulative impacts,¹¹⁵ but in terms of quantifying greenhouse gas emissions an agency must determine whether upstream emissions will be addressed in addition to those directly attributable to the construction and operation of the project.¹¹⁶ The Commonwealth of Massachusetts, King County, Washington, and Seattle, Washington have taken steps to require greenhouse gases to be assessed in environmental review documents.¹¹⁷ The California Environmental Quality Act also likely requires analysis of global climate change impacts for projects subject to the act, however no explicit guidance currently exists with regard to whether upstream emissions must be included.

a. Quantifying Greenhouse Gas Emissions in Massachusetts

In Massachusetts, the Executive Office of Energy and Environmental Affairs (EEA) determined that greenhouse gas emissions were subject to regulation under the

¹¹⁵ 40 C.F.R. §§ 1508.8, 1508.27.

¹¹⁶ See generally, Jones, *supra* note 93.

¹¹⁷ *Id.* at 6.

Massachusetts Environmental Policy Act (MEPA).¹¹⁸ As a result of this determination, certain projects will now have to account for greenhouse gas emissions as part of the environmental compliance process.¹¹⁹ The EEA will require analysis of "both 'direct' GHG emissions (e.g. stack emissions from the proposed operation) and 'indirect emissions (e.g. emissions from vehicles driven by employees and generating plants supplying electricity to the proposed operation)." ¹²⁰

EEA defines direct emissions as "the emissions from on-site stationary sources of the facility itself."¹²¹ Although there is a nonexclusive list of stationary sources included within the rule, these are sources where combustion of a carbon based fuel leads to stack emissions.¹²² Indirect emissions are broken down by EEA into two separate categories.

¹¹⁸ MASSACHUSETTS, EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS, MEPA Greenhouse Gas Emissions Policy and Protocol, 1 (2007), <http://www.mass.gov/envir/mepa/pdf/misc/ghgpolicyfinal.pdf>.

¹¹⁹ *Id.* at 1.

¹²⁰ *Id.* at 3.

¹²¹ *Id.* at 4.

¹²² See MEPA Greenhouse Gas Emissions Policy and Protocol, *supra* note 118 at 4.

Indirect Emissions from Energy Consumption

A Project also indirectly causes GHG emissions when it consumes energy generated off-site through the combustion of fossil fuels. Therefore, the proponent should quantify the GHG emissions derived from the purchase and consumption of electricity, heat (steam, hot water, etc.) or cooling provided from off-site sources such as the electrical utility or district heating or cooling a building.

Indirect Emissions from Transportation

Projects also generate GHG emissions indirectly through traffic generation and associated fuel combustion. Therefore, the Policy requires proponents to model the indirect emissions from transportation, including travel by employees, vendors, customers, and others.¹²³

EEA also recognizes that in some instances there will be additional sources of emissions not covered by the three categories mentioned above, such as methane emissions from landfills. EEA has provided that those emissions will be examined on a case-by-case basis.¹²⁴

What is immediately noticeable about the Massachusetts standards is that there is no clear requirement to account for the greenhouse gas emissions that result from the construction or development of the project itself. While it is possible that some construction emissions may fall

¹²³ See MEPA Greenhouse Gas Emissions Policy and Protocol, *supra* note 118 at 5.

¹²⁴ *Id.* at 6.

into the indirect emissions from transportation category, much of the guidance with respect to calculating these emissions speaks of modeling for new motor vehicle trips and additional vehicle miles traveled. Those two categories do not clearly include construction activities associated with building the project.¹²⁵ The rule does not provide for an accounting of the impact of the construction materials themselves on global climate change.

Additionally, the rule does not provide for any mechanism to account for the cumulative impacts of the project that are foreseeable results of the action. While the requirements of the Massachusetts rule appear to account for the emissions resulting from the direct operation of the project, by failing to account for the emissions associated with construction of the project and particularly the cumulative impacts of the project, it leaves substantial sources of emissions attributable to the project outside of the quantification requirements.

b. Quantifying Greenhouse Gas Emissions in King County, WA

As referenced above, two localities have interpreted Washington's state environmental policy act (SEPA) to require the consideration of greenhouse gas emissions prior

¹²⁵ MEPA Greenhouse Gas Emissions Policy and Protocol, *supra* note 188 at 5-6.

to the issuance of local land use permits.¹²⁶ Specifically both localities require greenhouse gas emissions to be identified and evaluated for both public and private projects subject to SEPA.¹²⁷ King County having moved to require greenhouse gasses to be evaluated earlier than Seattle has provided some guidance concerning the types of impacts that must be evaluated in an application.¹²⁸ Although Seattle has yet to fully implement a process, its Department of Planning and Development indicates there are plans to work with King County in order to refine the emissions worksheet used by King County for possible use by the city.¹²⁹

King County's method of accounting greenhouse gas emissions differs from Massachusetts' method, in that it is not limited to the operational emissions from the project. "The SEPA GHG Emissions worksheet estimates all GHG emissions that will be created over the life span of a

¹²⁶ See *Evaluation of Climate Change Impacts through the State Environmental Policy Act*, King County Executive Order 31 August 2007; Seattle City Ordinance 122574 signed December 10, 2007.

¹²⁷ *Id.*

¹²⁸ See King County Department of Development and Environmental Services SEPA GHG Emissions Worksheet Version 1.7 [*hereinafter* Worksheet] (12/26/07) found at www.metrokc.gov/ddes/forms/SEPA-GHG-EmissionsWorksheet-Bulletin26.pdf.

¹²⁹ See, Background Statement on Seattle policy found at www.seattle.gov/dpd/Planning/GreenhouseGas/Background/default.asp.

project. This includes emissions associated with obtaining construction materials, fuel used during construction, energy consumed during a building's operation, and transportation by building occupants."¹³⁰ The guidance breaks these emissions into three categories, embodied emissions, energy emissions, and transportation emissions.¹³¹ The energy and transportation emissions appear to be similar if not identical to the direct and indirect emissions accountable under the Massachusetts program.¹³² The "embodied emissions" accountable under the King County program however include the emissions associated with "[t]he extraction, processing, transportation, construction and disposal of materials and landscape disturbance."¹³³ There does not appear to be any formal miscellaneous category under the King County guidance designed to capture uncommon sources of greenhouse gas emissions such as methane emissions from a landfill.¹³⁴

¹³⁰ Worksheet, *supra* note 128 at 1.

¹³¹ *Id.*

¹³² See *Id.*, MEPA Greenhouse Gas Emissions Policy and Protocol, *supra* note 188.

¹³³ See Worksheet *supra* note 128.

¹³⁴ See *Id.*, c.f. MEPA Greenhouse Gas Emissions Policy and Protocol, *supra* note 188.

King County's requirements appear to provide a much more complete accounting of the greenhouse gas emissions attributable to any particular project than the Massachusetts plan. By requiring the emissions attributable to the construction as well as subsequent operation of a particular project, the King County checklist provides the more complete picture of total impacts on global climate change of the two. The King County plan, however, does not require any evaluation of the potential cumulative impacts of development actions on global climate change. While there is no indication as to why cumulative impacts were omitted from the calculations, SEPA does appear to require the consideration of cumulative impacts in certain circumstances.¹³⁵ The method utilized by King County could easily be adapted to account for the cumulative impacts of a project once the appropriate foreseeable future projects could be identified.

c. Quantifying Greenhouse Gas Emissions in California

California also requires global climate change to be evaluated for projects subject to the California Environmental Quality Act (CEQA). "In light of our current understanding of these [global climate change] impacts,

¹³⁵ See WAC 197-11-792.

public agencies approving projects subject to the CEQA are facing increasing pressure to identify and address potential significant impacts due to GHG emissions."¹³⁶ In fact, the California Office of the Attorney General (AG) has already settled litigation under CEQA to require the evaluation of global climate change impacts.¹³⁷ Despite this enforcement effort, no formal guidance exists with respect to accomplishing the evaluation of global climate change impacts.¹³⁸ Commentators have indicated that emissions associated with construction activities should be included in quantification efforts.¹³⁹

d. Quantifying Greenhouse Gas Emissions Under NEPA

For the purpose of satisfying the quantification requirement of *Center for Biological Diversity*, federal agencies should make an effort to quantify the global climate change impacts associated with construction, to include the modification or destruction of any carbon sinks, in addition to energy and transportation related

¹³⁶ CALIFORNIA AIR POLLUTION CONTROL OFFICERS ASSOCIATION, CEQA AND CLIMATE CHANGE, 1 (2008).

¹³⁷ *California v. County of San Bernadino*, Order Regarding Settlement No.CIVSS 0700329, Superior Ct. Cal., County of San Bernadino (Aug 28, 2007).

¹³⁸ See CEQA AND CLIMATE CHANGE, *supra* note 136 at 1.

¹³⁹ See *Id.* at 65.

impacts. While the global climate change impacts associated with the construction of projects would likely be small in the context of the overall impacts,¹⁴⁰ failing to include them when quantifying emissions could present significant litigation risks. By consciously omitting an entire category of quantifiable greenhouse gas emissions without an adequate explanation, NEPA analyses might not satisfy the "hard look" requirement.¹⁴¹

2. Cumulative Impacts Analysis

The second requirement arising out of *Center for Biological Diversity supra*, is that global climate change impacts must be evaluated as part of a cumulative impacts analysis.¹⁴² In the absence of any guidance or regulation regarding global climate change impacts, several aspects of the cumulative impacts analysis present issues due to the nature of greenhouse gas emissions. Prior to identifying those issues, it is important to distinguish cumulative impacts from cumulative actions.

¹⁴⁰ See Worksheet, *supra* note 128.

¹⁴¹ See *Robertson v. Methow Valley*, *supra* note 28; see also *Center for Biological Diversity v. NHTSA*, *supra* note 6.

¹⁴² *Center for Biological Diversity v. NHTSA*, *supra* note 6 at 550.

a. Cumulative Impacts and Cumulative Actions

As discussed in Section II *supra*, the CEQ regulations define cumulative impacts as:

The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.¹⁴³

The term cumulative action is found within the definition of "Scope" in the CEQ regulations.¹⁴⁴ Cumulative actions are one of three types of actions that an agency must consider in an EIS and is defined as follows: "[c]umulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement."¹⁴⁵ In addition to requiring agencies to consider cumulative actions as one of three different types within the EIS scoping process, agencies are also required to consider cumulative impacts as one of three categories of impact in the EIS.¹⁴⁶

The distinction between the two concepts is significant in light of the holding of *Kleppe, supra*.

¹⁴³ 40 C. F. R. § 1508.7.

¹⁴⁴ See 40 C.F.R. § 1508.25.

¹⁴⁵ 40 C.F.R. § 1508.25(a)(2).

¹⁴⁶ 40 C.F.R. § 1508.25(c).

"Some have interpreted *Kleppe* to require that only the cumulative impacts of concrete proposals be considered in one EIS."¹⁴⁷ Much focus has been on footnote 20 within *Kleppe*, which provides:

The statute, however, speaks solely in terms of Proposed actions; it does not require an agency to consider the possible environmental impacts of less imminent actions when preparing the impact statement on proposed actions. Should contemplated actions later reach the stage of actual proposals, impact statements on them will take into account the effect of their approval upon the existing environment; and the condition of that environment presumably will reflect earlier proposed actions and their effects.¹⁴⁸

The issue in *Kleppe*, however, was not whether cumulative impacts of a proposed action had been adequately discussed; the issue was whether all proposed coal-leasing actions were required to be included within a single EIS.¹⁴⁹ Despite the fact that the issue resolved in *Kleppe* did not deal with the adequacy of a cumulative impacts analysis, some courts have interpreted it to mean that only actions which are actual proposals are reasonably foreseeable for the purposes of cumulative impacts analysis.¹⁵⁰

¹⁴⁷ Terrence L. Thatcher, *Understanding Interdependence in the Natural Environment: Some Thoughts on Cumulative Impact Assessment under the National Environmental Policy Act*, ENVTL. L., 611, 620 (1990).

¹⁴⁸ *Kleppe v. Sierra Club*, *supra* note 29 at 410, fn 20.

¹⁴⁹ See *Kleppe v. Sierra club*, *supra* note 29 at 408-409.

¹⁵⁰ See *Society Hill Towers Owners' Ass'n v. Rendell*, 210 F.3d 168, 180-181 (3rd Cir. 2000).

While it is clear that "NEPA does not mandate that every conceivable possibility which someone might dream up must be explored in an EIS," ¹⁵¹ the fact that the CEQ regulations, published after *Kleppe*, distinguish between cumulative actions and cumulative impacts may lead to a determination that foreseeable future impacts include more than proposed actions.¹⁵²

The "cumulative impact" regulation requires the Corps to evaluate "the incremental impact of the action when added to other past, present, and reasonably foreseeable actions." 40 C.F.R. § 1508.7. Although the CEQ guidelines require that "cumulative actions" be considered together in a single EIS, 40 C.F.R. § 1508.25(a)(2), and "cumulative actions" consist only of "proposed actions," this does not negate the requirement of 40 C.F.R. § 1508.7 that the Corps consider cumulative impacts of the proposed actions which supplement or aggravate the impacts of past, present, and reasonably foreseeable actions.¹⁵³

While the regulations do not define "reasonably foreseeable," courts have interpreted this requirement in light of the purposes underlying NEPA.

NEPA serves two purposes: 'First [i]t ensures that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant

¹⁵¹ *Concerned About Trident v. Rumsfeld*, 555 F.2d 817, 829 (D.C. Cir. 1977).

¹⁵² See *Thatcher*, *supra* note 146 at 619.

¹⁵³ *Oregon v. Natural Resources Council v. Marsh*, 823 F.2d 1489, 1497-98 (9th Cir. 1987), *rev'd on other grounds*, 109 S.Ct. 1851 (1989).

environmental impacts.' Second, it 'guarantees that the relevant information will be made available to the larger audience that may also play a role in both the decision making process and the implementation of that decision',¹⁵⁴

In light of these purposes, the rule of reason requires that agencies discuss only those actions that "are sufficiently concrete for the agency to gather information useful to itself and the public."¹⁵⁵ While this standard will encompass more potential actions than *Kleppe*, a federal agency will have discretion in identifying the reasonably foreseeable actions.

b. Framing the Cumulative Impacts Analysis

CEQ has published a handbook and a formal guidance document with regard to the analysis of cumulative impacts. The formal guidance document focuses on the consideration of past actions in cumulative effects analyses¹⁵⁶ while the handbook looks at all aspects of the cumulative impacts analysis.¹⁵⁷ Both documents clearly identify the scoping

¹⁵⁴ *City of Oxford v. F.A.A.* 428 F.3d 1346, 1353 (11th Cir 2005) (citations omitted).

¹⁵⁵ *Id.* at 1354.

¹⁵⁶ See Memorandum from James L. Cannaughton, Chairman, Council on Environmental Quality, Executive Office of the President, *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis, hereinafter Past Actions*] (June 24, 2005) available at <http://www.nepa.gov/nepa/regs/guidance.html>.

¹⁵⁷ See CUMULATIVE EFFECTS HANDBOOK, *supra* note 38.

process as the key point to beginning a cumulative impacts analysis.¹⁵⁸

Through the use of the scoping process, federal agencies are able to narrow the focus of the analysis to "important issues of national, regional, or local significance."¹⁵⁹ While *Center for Biological Diversity* has effectively identified global climate change impacts as an important issue for the purposes of the analysis, federal agencies must still identify the geographic boundaries, the appropriate time frames of analysis along with the past, present, and reasonably foreseeable future actions to be considered.¹⁶⁰

i. Geographic Boundary

The global nature of greenhouse gas emissions complicates establishing geographic boundaries for a cumulative impacts analysis. The CEQ handbook provides that in looking to establish a geographic boundary for the analysis, an agency should consider the area that will be affected by the action.¹⁶¹ Because greenhouse gases circle the globe once emitted, it would seem that the geographic

¹⁵⁸ See CUMULATIVE EFFECTS HANDBOOK, *supra* note 38 at 12; also see *Past Actions*, *supra* note 155 at 1.

¹⁵⁹ *Id.*

¹⁶⁰ CUMULATIVE EFFECTS HANDBOOK, *supra* note 38 at 12-21.

¹⁶¹ CUMULATIVE EFFECTS HANDBOOK, *supra* note 38 at 15.

area for analysis would likely be global with respect to climate.¹⁶² In terms of selecting an appropriate boundary, however, "which boundary is the most appropriate depends both on the accumulation characteristics of the effects being assessed and an evaluation of the management or regulatory interests of the agencies involved."¹⁶³ Certainly, the regulatory and management interests of most agencies are not global in nature.

Notwithstanding the global nature of greenhouse gas emissions, since courts are beginning to view greenhouse gases as air pollutants, it may be appropriate to establish a geographic boundary consistent with other air emissions. The CEQ handbook suggests that with respect to air emissions, "air quality regions are defined by the EPA, and these regions are an appropriate boundary for assessment of the cumulative effects of releases of pollutants to the atmosphere."¹⁶⁴ Because greenhouse gases are not regulated under the Clean Air Act, however, emissions data by air quality control region is not maintained. A second possible boundary could be state boundaries, although as of 2006 only 42 states had developed greenhouse gas emissions

¹⁶² CUMULATIVE EFFECTS HANDBOOK, *supra* note 38 at Table 2-2.

¹⁶³ *Id.* at 16.

¹⁶⁴ *Id.* at 16.

inventories.¹⁶⁵ Because greenhouse gas emissions have a global impact, and because no jurisdictions have been established for the regulation of greenhouse gas emissions, the selection of any geographic area will in some sense be arbitrary.

Geographic scoping decisions may be further complicated based upon the availability of modeling software. In *Mayo Foundation supra*, the Surface Transportation Board ultimately conducted an analysis of the potential impacts of its decision on carbon dioxide emissions.¹⁶⁶ With respect to the analysis conducted, no local analysis was done because the modeling software used for the analysis did not account for local impacts.¹⁶⁷ The court determined that the analysis was sufficient to satisfy the requirements of NEPA, notwithstanding the lack of local analysis holding that the decision was done in accordance with the CEQ regulations addressing analyses with incomplete or unavailable information found at 40 C.F.R. § 1502.22.¹⁶⁸

¹⁶⁵ State Planning and Measurement, available at http://www.epa.gov/climatechange/wycd/stateandlocalgov/state_planning.html.

¹⁶⁶ See *Mayo Foundation v. Surface Transportation Board*, *supra* note 74.

¹⁶⁷ *Id.* at 555.

¹⁶⁸ *Id.*

While 40 C.F.R. §1502.22 speaks about analysis in terms of an EIS, the same analysis could be conducted within the confines of an EA. In order for a manageable analysis to occur, a justification consistent with 40 C.F.R. §1502.22 likely will be required for the selected geographic boundary and ultimate scope of the cumulative impacts analysis.

ii. Temporal Boundary

Establishing an appropriate time frame of reference for the analysis of greenhouse gas emissions may, however, not be as difficult as establishing the appropriate geographic boundaries. While greenhouse gases may remain suspended in the atmosphere for decades, it may generally be appropriate to look to the "time frame of the project specific analysis."¹⁶⁹ In light of the longevity that greenhouse gases experience in the atmosphere, utilizing the time frame of the project may, as with setting a geographical boundary, seem in some sense arbitrary. The required analysis, however, is limited to reasonably foreseeable future actions, which will likely require a temporal boundary that is significantly shorter than the decades that greenhouse gases remain in the atmosphere. To

¹⁶⁹ CUMULATIVE EFFECTS HANDBOOK, *supra* note 38 at 16.

require otherwise seems contrary with the requirement that that actions be reasonably foreseeable. The farther an agency is required to predict actions into the future, the farther the prediction strays from being reasonably foreseeable.

c. Identifying Actions to Include

Identifying appropriate past, present, or reasonably foreseeable actions must be done in the context of the geographical and temporal boundaries selected for the purposes of the analysis. Even within a more limited geographic boundary such as an air quality control region, the number of potential sources of greenhouse gas emissions would be substantial as individual residences and automobiles are sources of greenhouse gas emissions.¹⁷⁰

Ultimately, the most difficult aspect of conducting a global climate change cumulative impacts analysis may be identifying the reasonably foreseeable future impacts. The definition of cumulative impacts clearly requires the consideration of the future impacts of individuals as well as agencies.¹⁷¹

In general, future actions can be excluded from the analysis of cumulative effects if

¹⁷⁰ See generally Reitze, *supra* note 9.

¹⁷¹ 40 C.F.R. § 1508.7.

- * the action is outside the geographic boundaries or time frame established for the cumulative effects analysis;
- * the action will not affect resources that are the subject of the cumulative effects analysis; or
- * including of the action would be arbitrary¹⁷²

Future actions may also be excluded if they are not reasonably foreseeable.¹⁷³ Because any geographic limitation of greenhouse gas emissions will necessarily be arbitrary, the geographic boundaries of the analysis should likely be limited to an area where reasonably foreseeable future projects can be identified.¹⁷⁴

In terms of identifying the reasonably foreseeable future impacts, the decision by the Supreme Court in *Department of Transportation v. Public Citizen (Public Citizen)*,¹⁷⁵ would also appear to provide some limitation to the scope of the NEPA analysis. In *Public Citizen*, the Court held that "where an agency has no ability to prevent a certain effect due to its limited statutory authority over the relevant actions, the agency cannot be considered a legally relevant 'cause' of the effect."¹⁷⁶ The Court

¹⁷² CUMULATIVE EFFECTS HANDBOOK, *supra* note 38 at 19.

¹⁷³ 40 C.F.R. § 1508.7.

¹⁷⁴ See CUMULATIVE EFFECTS HANDBOOK, *supra* note 38 at 19.

¹⁷⁵ 541 U.S. 752 (2004).

¹⁷⁶ *Id.*, at 771.

applied this same rationale to its examination of the cumulative impacts analysis.¹⁷⁷ Under that rationale, the foreseeable future effects that must be considered by an agency may be limited to those that are subject to its control. This issue was raised in *Center for Biological Diversity*, and while the 9th Circuit distinguished the facts of the case from those in *Public Citizen*, many federal projects should be able to limit the foreseeable future impacts to those that are caused by the proposed project.

Despite the difficulties that may be associated with appropriately framing the scope of the cumulative impacts analysis with respect to global climate change, a cumulative impacts analysis will be possible. In the absence of any form of federal regulation, however, the sufficiency of the analysis may depend upon a court's acceptance of the boundaries established during the analysis. *Center for Biological Diversity* did not specify boundaries; it simply required that some amount of analysis be conducted.¹⁷⁸ Assuming that boundaries established for the purposes of the analysis are supported in the record, federal agencies should be able to conduct an analysis. Whether the selected boundaries of that analysis will be

¹⁷⁷ *Dept of Transportation v. Public Citizen*, *supra* note 175 at 770-771.

¹⁷⁸ See *Center for Biological Diversity v. NHTSA*, *supra* note 6.

acceptable though, will leave a substantial amount of uncertainty in the process.

3. Determining Significance

As with any EA, once a federal agency has quantified the emissions associated with the project and conducted some analysis with respect to the cumulative impacts of the project, a determination must be made as to significance of the impact. Because a finding of significant impact on the human environment will result in a requirement to conduct further environmental analysis if the form of an EIS,¹⁷⁹ this represents a crucial determination in the NEPA process.

Determinations of significance are made in light of two factors, context and intensity.¹⁸⁰ In terms of context, "[s]ignificance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole."¹⁸¹ Once the context of a proposed action is appropriately framed, the next step in a significance determination is to determine intensity. "Intensity . . . refers to the

¹⁷⁹ See generally, 40 C.F.R. Pt 1500 et seq.

¹⁸⁰ 40 C.F.R § 1508.27.

¹⁸¹ 40 C.F.R. § 1508.27(a).

severity of impact."¹⁸² The regulations provide a list of ten factors to consider in determining the severity of the impact and are found in the CEQ regulations;¹⁸³ "[a]n action may be 'significant' if one of these factors is met."¹⁸⁴

Because *Center for Biological Diversity* implicitly requires a quantitative analysis for global climate change impacts,¹⁸⁵ it appears that some comparison to an established quantitative threshold would be required.¹⁸⁶ "The concept of a baseline against which to compare predictions of effects of the proposed action and reasonable alternatives is critical to the NEPA process."¹⁸⁷ The fundamental difficulty with making a quantitative threshold determination, however, is that there are no currently accepted threshold levels for greenhouse gas emissions.¹⁸⁸

¹⁸² 40 C.F.R. § 1508.27(b).

¹⁸³ *Id.*

¹⁸⁴ *Center for Biological Diversity v. NHTSA*, *supra* note 6 at 553 citations omitted.

¹⁸⁵ See *Center for Biological Diversity v. NHTSA*, *supra* note 6.

¹⁸⁶ Hendrix, *supra* note 114 at 12. "In the Quantitative Analysis without Significance Determination approach, GHG emissions from the project are quantified but are not compared to a quantitative threshold." *Id.*

¹⁸⁷ CUMULATIVE EFFECTS HANDBOOK, *supra* note 38 at 41.

¹⁸⁸ See *Id.*

It is difficult to imagine how a federal agency could comply with the requirements of *Center for Biological Diversity* without an established threshold. The Ninth Circuit expressly rejected the agency determination that a decrease in greenhouse gas emissions did not rise to the level of significance. Despite a determination that the federal action would represent "a decrease in the rate of growth of greenhouse gas emissions,"¹⁸⁹ the court found: "[n]owhere does the EA provide a 'statement of reasons' for a finding of no significant impact, much less a 'convincing statement of reasons.'" ¹⁹⁰ How a federal agency would be able to provide that convincing statement of reasons when a reduction was deemed insufficient in the absence of an accepted baseline or threshold was left as an open question. Ultimately, the court's decision to simply order that an EIS be conducted provides little guidance as to what would be considered an appropriate threshold.

Various bills have been proposed in Congress regarding potential greenhouse gas limitations. All of the proposals would look to make significant reductions over time in U.S. economy wide greenhouse gas emissions using the year 1990

¹⁸⁹ *Center for Biological Diversity v. NHTSA*, *supra* note 6 at 549.

¹⁹⁰ *Center for Biological Diversity v. NHTSA*, *supra* note 6 at 556.

as a baseline.¹⁹¹ California has mandated reductions in greenhouse gas emissions leading to the equivalent of 80% below 1990 levels by the year 2050.¹⁹² Without federal standards being established, however, federal agencies are without a point of comparison. Being without a point of an established threshold, however, places federal agencies in a position of substantial uncertainty with regard to the sufficiency of global climate change NEPA analyses. The passage of federal legislation imposing a regulatory cap and trade system could provide a framework to determine an appropriate baseline and threshold. Additionally, a decision by the EPA with regard to the regulation of greenhouse gas emissions consistent with the directions in *Massachusetts v. EPA* could also provide the framework for federal agencies to make determinations of significance. Until an acceptable threshold is established, however, federal agencies must develop a means of addressing global climate change impacts to ensure compliance with NEPA.

¹⁹¹ Pew Center for Global Climate Change, *Economy-wide Cap-and-Trade Proposals in the 110th Congress Economy-wide Cap-and-Trade Proposals in the 110th Congress*, available at http://www.pewclimate.org/what_s_being_done/in_the_congress/110thcongress.cfm.

¹⁹² California Executive Order S-3-05, 1 June 2005.

V. UTILIZATION OF THE NET-ZERO THRESHOLD AS A SOLUTION

Without an established threshold to utilize in making determinations of significance, agencies could utilize a net zero threshold as a baseline for analysis.¹⁹³ An analysis using a net zero threshold following quantification of greenhouse gas emissions would compare the greenhouse gas emissions against a "zero net carbon dioxide equivalent increase as the threshold."¹⁹⁴ In other words, any increase in carbon dioxide equivalent attributable to a major federal project would be considered significant under NEPA.¹⁹⁵

The obvious issue with respect to utilizing this threshold is that any project that results in an increase in greenhouse gas emissions would be considered significant.¹⁹⁶ It would be difficult to imagine a major federal action that would be unlikely to result in some increase in greenhouse gas emissions no matter what type of emissions you chose to include in the quantification. While it is possible that some combination of mitigation projects or offset programs could yield a net zero increase of

¹⁹³ See e.g. Hendrix, *supra* note 114 at 13; see also CEQA AND CLIMATE CHANGE, *supra* note 136 at ch. 6.

¹⁹⁴ Hendrix, *supra* note 114 at 13.

¹⁹⁵ See generally CEQA AND CLIMATE CHANGE, *supra* note 136 at 27.

¹⁹⁶ *Id* at 13; see also CEQA AND CLIMATE CHANGE, *supra* note 136 at 28.

greenhouse gas emissions¹⁹⁷, at some point it likely becomes impractical to achieve a net zero increase in emissions. In order to make this standard workable, federal agencies could alter the standard slightly by recognizing some *de minimis* level of emissions. Greenhouse gas emissions above the *de minimis* level would carry the presumption of significance, while greenhouse gas emissions at or below the *de minimis* threshold would be insignificant.¹⁹⁸

At first glance, utilizing a net-zero threshold modified to include a *de minimis* allowance seems to lead a federal agency toward an almost automatic preparation of an EIS. This is true only if no efforts to mitigate and reduce the greenhouse gas emissions above the *de minimis* allowances are made. The specific measures a federal agency could choose to meet this threshold could include numerous actions designed to reduce the impact of the actual project. In addition to mitigation measures designed to reduce the emissions attributable to the actual project, purchasing offsets and preserving or developing carbon

¹⁹⁷ CEQA AND CLIMATE CHANGE, *supra* note 136 at 13; see also CEQA AND CLIMATE CHANGE, *supra* note 136 at 28.

¹⁹⁸ See generally CEQA AND CLIMATE CHANGE, *supra* note 136 at 25. The authors discuss the idea of presumptive significance within an examination of a no threshold analysis.

sinks could provide further mechanisms to meet the threshold.¹⁹⁹

One benefit to utilizing a net-zero threshold, from the perspective of the federal agency, would be certainty. If a project effectively generates no additional global emissions of greenhouse gases, there can be no impact on the environment. A project that generates no impact on the environment cannot implicate the need for an EIS, which should reduce concerns over litigation challenging the validity of the FONSI.

VI. CONCLUSION

It is apparent that federal agencies will be required to analyze global climate change in NEPA documents. Unlike other environmental impacts, however, greenhouse gas emissions impacting global climate change are not isolated impacts. As the result in *Center for Biological Diversity* illustrates, federal agencies will face substantial uncertainty with regard to conducting satisfactory analysis of the global climate change impacts of a major federal action. Some form of Congressional or Executive action to establish a baseline and thresholds of comparison will be required to provide some certainty. Until that action is taken, a federal agency cannot make adequate determinations

¹⁹⁹ See CEQA AND CLIMATE CHANGE, *supra* note 136 at 36.

with regard to the necessity of an EIS. It would be hard to imagine that Congress intended that every major action taken by the federal government would have a significant impact on the human environment. Without an established baseline or threshold, however, federal agencies will face the potential for constant NEPA litigation or the costs associated with completing substantially more EIS's.

Federal agencies could alleviate those issues by utilizing a net-zero threshold with an allowance for *de minimis* greenhouse gas emission increases. A federal agency could comply with global climate change NEPA requirements by completely offsetting the greenhouse gas emissions causing the global climate change impacts attributable to the project using mitigation measures. Projects with net-zero increases in greenhouse gas emissions would result in the need for fewer EIS's due to global climate change impacts, and provide a defensible result in the event that an EA FONSI were challenged.